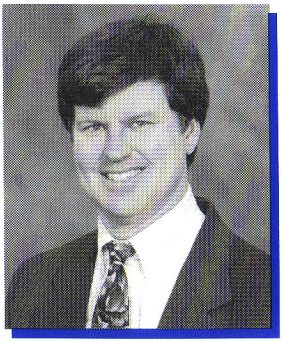
Department of Defense—U.S. Navy
Naval Undersea Warfare Center (NUWC) Division, Newport

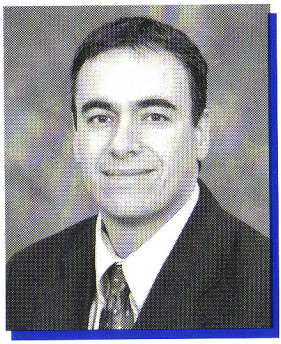
Digital Image Enhancement

A sailor trying to find mines in a cluttered underwater environment faces the same challenges as a physician looking for microcalcifications in a mammogram of dense breast tissue. Both of these searches can benefit from digital image enhancement. Michael Duarte of the Naval Undersea Warfare Center (NUWC) Division, Newport developed a digital image enhancement technology that uses wavelets and mathematical functions, which serve as building blocks to represent data. Applying the digital image enhancement allows small objects to be found in a large, complex area. This patented technology, as applied to breast cancer screening, would improve the physician's ability to detect microcalcifications on a mammogram, thus catching cancer at an earlier stage than previously possible. Early detection would improve the patient's chance of survival and allow less invasive treatment options.



James Kasischke

Duarte, a digital signal processing expert, noted the similarities between underwater mine-hunting sonar and the problems of detecting small lesions in mammograms. Under dual-use funding, he began working on mammogram digital image enhancement, using NUWC's state-of-the-art technical facilities. Duarte then worked with James Kasischke, a NUWC patent attorney, to identify business and patent opportunities that led to CRADAs with Advanced Image Enhancement, Inc. (AIE) and the Slater Center for Interactive Technologies. A licensing agreement has also been established with AIE.



Michael Duarte

Thanks to Duarte, the Navy has successfully transferred undersea mine-hunting technology to the medical community. Digital image enhancement will enable doctors to have greater success detecting early-stage breast cancer, and women will benefit from early detection, resulting in thousands of lives saved.

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